

Patent Claims

- Sub 12
1. An apparatus for generating surface pressure, in particular in an injection molding machine, having a stationary carrier platen and a clamping platen which can be moved in relation to said carrier platen and locked in a working position and which, on its side facing the carrier platen, has a closing platen that can be moved electromechanically, material to be pressed or tools to be clamped being disposed between said closure platen and the carrier platen, characterized in that the compressive force of the closing platen and the action of moving it at the working point are implemented with piezoelectric actuators.
2. The apparatus for generating surface pressure as claimed in claim 1, characterized in that the piezoelectric actuators are distributed as desired, preferably in matrix fashion, over the area between clamping platen (AP) and closing platen (SP).
3. The apparatus for generating surface pressure as claimed in claim 1, characterized in that the piezoelectric actuators (P11-Pnn) are distributed over the area between clamping platen (AP) and closing platen (SP) in accordance with a desired force distribution.
4. The apparatus for generating surface pressure as claimed in claim 1, characterized in that the piezoelectric actuators (P11-Pnn) are actuated differently over

the area between clamping platen (AP) and closing platen (SP) in accordance with a desired force distribution.

5 5. The apparatus for generating surface pressure as claimed in claim 1, characterized in that in the event of dynamic behavior of the material to be pressed or the tools to be clamped (FH1, FH2), the piezoelectric actuators can likewise be triggered dynamically, matched to said behavior.

6. The apparatus for generating surface pressure as claimed in claim 1, characterized in that a specific number of piezoelectric actuators is needed, which is derived from the necessary forces and expansions.

10 7. The apparatus for generating surface pressure as claimed in claim 1, characterized in that the closing platen (SP) can also be locked in at least one intermediate position which makes up a piezoelectric stroke and from which the clamping platen (AP) can subsequently be guided, the latter then being locked and the closing platen (SP) being moved out by a further piezoelectric stroke.

15 8. The apparatus for generating surface pressure as claimed in claim 1, characterized in that the piezoelectric actuators (P11-Pnn) are produced with any desired geometry, preferably cube-like, in accordance with the production possibilities.

20 9. The apparatus for generating surface pressure, characterized in that additional piezoelectric sensors are provided between closing platen (SP) and clamping platen (AP).

10. The apparatus for generating surface pressure as claimed in claims 1 and 2, characterized in that during operation, a subset of the piezoelectric actuators (P11-Pnn) can be used as piezoelectric sensors.

11. The apparatus for generating surface pressure as claimed in claims 1 and 2,
5 characterized in that during operation, piezoelectric actuators (P11-Pnn) can be used briefly as piezoelectric sensors.

add B3